CLAIMS

1. In an intermediate network device having at least one line card defining a plurality of ports for receiving and forwarding messages and two or more supervisors, each supervisor configured to run one or more applications to facilitate message handling by the network device, a method for continuing operation of at least one application despite crashes or failures, the method comprising the steps of:

designating a first supervisor to be an active supervisor and a second supervisor to be a standby supervisor for the network device;

executing the at least one application at the active supervisor;

holding the at least one application at the standby supervisor in a dormant state;

transmitting state information generated during execution of the at least one application from the active supervisor to the standby supervisor;

storing the state information at the standby supervisor; and

in response to a failure at the active supervisor, carrying on execution of the at least one application at the standby supervisor based upon at least some of the stored state information.

2. The method of claim 1 further comprising the step of defining a synchronization database having one or more synchronization records at the active supervisor, wherein

the synchronization records store state information to be transmitted to the standby supervisor.

3. The method of claim 2 further comprising the step of updating one or more of the synchronization records in response to an operating change at the at least one application program.

4. The method of claim 3 wherein the transmitting step comprises the step of sending the one or more updated synchronization records to the standby supervisor.

5. The method of claim 1 further comprising the steps of:

generating a sequence number for use in instructing the at least one line card to change operating condition;

sending the sequence number to the at least one line card with the instruction; and

storing the sequence number at the at least one line card.

6. The method of claim 5 further comprising the steps of:

sending the sequence number to the standby supervisor;

storing the sequence number at the standby supervisor; and

in response to a failure of the active supervisor, comparing the sequence number stored at the standby supervisor with the sequence number at the at least one line card.

7. The method of claim 6 further comprising the step of continuing operation of the at least one line card, following a crash or failure of the active supervisor, if the sequence number stored at the at least one line card is one of (a) less than or equal to or (b) greater than the sequence number stored at the standby supervisor.

8. The method of claim 7 further comprising the step of resetting the at least one line card, following a crash or failure of the active supervisor, if the sequence number stored at the at least one line card is one of (a) greater than or (b) less than or equal to the sequence number stored at the standby supervisor.

9. The method of claim 1 further comprising the steps of:

determining the validity of the state information stored at the standby supervisor following a crash or failure of the active supervisor; and

blocking the at least one application from utilizing state information determined to be invalid in its execution.

10. The method of claim 1 further comprising the steps of:

creating, at the active supervisor, an instance of an event in response to a request from an application;

providing the event instance to the requesting application for processing;

providing the event instance to any listening applications that have registered for the event for processing;

passing the event instance to the standby supervisor;

receiving notifications from the requesting and listening applications that they have completed their processing of the event instance;

passing the notifications to the standby supervisor; and

in response to receiving notifications from the requesting and all listening applications, closing the event instance at the active and standby supervisors.

11. The method of claim 10 further comprising the step of:

in response to a crash or failure of the active supervisor, determining whether one or more event instances passed to the standby supervisor remain open;

for a given event instance that remains open, identifying the requesting and listening applications that have not completed their processing of the given event instance;

for each requesting and listening application that has not completed its processing of the given event instance, calling a recovery function defined by the respective application to handle the open event instance.

12. An intermediate network device for use in a computer network, the network device comprising:

a first supervisor card in communicating relationship with the one or more line cards;

a second supervisor card in communication relations with the first supervisor card;

an application loaded onto the first and second supervisor cards, the application configured to define and manipulate a plurality of state variables; and

a high availability entity disposed on both the first and second supervisor cards, the high availability entities comprising:

an event mechanism for notifying a selected one of the first or second supervisor cards of changes to the application's state variables; and a database mechanism for storing the state variables at the first and second supervisor cards.

13. The network device of claim 12 wherein:

the first supervisor card is designated as an active supervisor card and the second supervisor card is designated as a standby supervisor card;

the application is allowed to run on the active supervisor card but not on the standby supervisor card; and

in response to a crash or failure of the active supervisor card, the application carries on its execution from the standby supervisor card utilizing at least some of the state variables stored at the database mechanism of the standby supervisor card.

14. The network device of claim 12 further comprising at least one line card defining a plurality of ports for forwarding messages across the computer network, the at least one line card in communicating relationship with the first and second supervisor cards and configured to receive and maintain port state information from the application, wherein

the high availability entities at the first and second supervisor cards further comprise:

a sequence mechanism for ensuring that the state variables stored at the first and second supervisor cards are consistent with the port state information maintained at the at least one line card.